

# Schedule Workshop 5

## "Kinematic Aspects of Robotics"

April 29 - May 3, 2024

Organizer: Andreas Müller, Zijia Li

|               | Monday<br>April 29   | Tuesday<br>April 30   | Wednesday<br>May 1  | Thursday<br>May 2  | Friday<br>May 3   |
|---------------|--|---|---|--|---|
| 09:00 - 10:00 | <b>Registration &amp; Introduction</b>   | <b>Zijia Li</b><br>Kinematic Singularities of Robot Chains  | <b>Jon Selig</b><br>The Geometry of the Adjoint Representation of SE(3)   | <b>Sylvain Calinon</b><br>Geometric representations for robot manipulation skills acquisition  | <b>Marco Carricato</b><br>Persistent Submanifolds of the Special Euclidean group SE(3)                        |
| 10:00 - 11:00 | <b>Charles Wampler</b><br>Finding overconstrained mechanisms via fiber products                          | <b>Josef Schicho</b><br>Explanations for Paradoxical Mobility   | <b>Peter Donelan</b><br>What can algebraic invariants tell us about robot kinematics                                  | <b>Maria Alberich Carramiñana &amp; Franco Coltraro</b><br>Modelling inextensible textiles by geometrical constraints tailored to robotic manipulation | <b>Abhilash Nayak</b><br>Configuration space analysis of mechanisms using tropical geometry                   |
| 11:00 - 11:30 | <b>Coffee Break</b>  | <b>Coffee Break</b>   | <b>Coffee Break</b>   | <b>Coffee Break</b>  | <b>Coffee Break</b>   |
| 11:30 - 12:30 | <b>Manfred Husty</b><br>On two open kinematic problems   | <b>Mohab Safey</b><br>Computer algebra in the service of robotics   | <b>Jean-Pierre Merlet</b><br>Tools for non polynomial kinematics: interval analysis, continuation and neural networks | <b>Pablo Lopez-Custodio</b><br>Intrinsic on-manifold trajectory learning for robotics  | <b>Andreas Mueller</b><br>Lie Bracketing for Investigating Singularities of holonomic and nonholonomic Robots |
| 12:30 - 14:00 | <b>Lunch Break</b>   | <b>Lunch Break</b>  | <b>Lunch Break</b>  | <b>Lunch Break</b>   | <b>Wrap up session &amp; Good-bye</b>   |
| 14:00 - 15:00 | <b>Xianwen Kong</b><br>Reconfiguration analysis and type synthesis of multi-mode parallel mechanisms     | <b>Mark Plecnik</b><br>The Purposeful Placement of Singularities  |   | <b>Alba Perez Gracia</b><br>Morphing surfaces: surface characterization and motion   |   |
| 15:00 - 15:30 | <b>Coffee Break</b>  | <b>Coffee Break</b>   | <b>15:30 - 17:00 Mural Harbor Tour</b>  | <b>Coffee Break</b>  |   |
| 15:30 - 16:30 | <b>Georg Nawratil</b><br>A global approach for the redefinition of higher-order flexibility and rigidity | <b>Durgesh Salunkhe</b><br>Cuspidal robots: geometrical analysis and issues in path planning of 6R cobots |   | <b>Mike McCarthy</b><br>Quaternions in Kinematics  |   |
|               | <b>16:30 Reception</b>   | Participant presentations   | <b>18:30 Dinner at Restaurant Klosterhof</b>  | Participant presentations  |   |